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DEVICE FOR CONNECTING AN INTERROGATION TERMINAL  
WITH A CONFIDENTIAL DATA SERVER  
[DISPOSITIF POUR CONNECTER UN TERMINAL D'INTERROGATION  
AVEC UN SERVEUR DE DONNEES CONFIDENTIELLES]

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## Description

The present invention concerns a device making it possible to connect a user, having, in particular, an interrogation terminal, through the telephone network, with a confidential data server, in particular a central computer capable of providing it with information that is not accessible to everyone.

More particularly, the invention is applicable to the case where the user has a terminal, portable or not, and wishes, by means of the network, to be connected to a data or information source, the availability of which to this user may be provided only for persons possessing an access authorization code for this information, this code being provided by the user and verified by means that permit its connection with the server only when this code is effectively recognized.

It is classic to provide, in a system of this type using a caller identification control, that the caller, who enters on his telephone line the call number of the server, be first asked to supply an access code, from which, once the code is identified, the connection between his line and the server can be established.

It is precisely this that is provided for nearly all limited access data bases, where the caller first must use the keyboard belonging to his telephone set or his "Minitel" device, to enter an secret code or password, which authorizes only his connection with the base requested.

Since it is possible to conceive that the caller's code has been divulged by the latter or that it has been stolen from him, in such a way that anyone who is thus aware of this code can wrongfully access the server, which is in itself particularly annoying and in certain cases can have very serious consequences in an interactive system where the caller himself introduces a priori verified command instructions.

A system of this type is known by the patent US-A 4- 815 031, and the patent US-A 4 679 226. However, these patents do not provide appropriate security with respect to a fraudulent use of a confidential data server.

According to these prior patents, in fact it is sufficient for the person perpetrating fraud to know the user's password to be able to call the server and to be connected to the latter, either from an authorized line, or from an ordinary line if, in this case, a complementary code required for establishing the connection is known in addition to the password.

The present application concerns a device that avoids this disadvantage by providing double security for the connection of a calling terminal with the central server, one security measure being performed by the entry of a given code by the user himself, as in classic solutions, the other being used by the server who recognizes the code provided and assures the connection with the caller only after himself having reestablished the telephone connection between the interrogation terminal and the data base that it comprises.

For this purpose, the device for connecting an interrogation terminal with a confidential data server, having a circuit for call detection performed by the intermediary of the telephone line of a user, occupying this line for a predetermined time, and a circuit for identification of a code entered by the caller, put in operation by the detection circuit before reaching the predetermined time, which then interrupts the communication emanating from the caller, is characterized by the fact that it also has a commutation module controlled by the detection and identification circuits, which triggers a callback module that takes the line in order to automatically call the caller's set and, simultaneously, to connect the latter to the data server, thus connecting it with the user's terminal.

In accordance with another feature, the device has a monitoring and supervision module, capable of interrupting the line at the end of use, by reinitializing the system.

Thus the invention consists in providing a connection control module with the server that retains in memory the telephone call numbers of all the authorized users, so that, after recognizing the access code or password, the communication is first cut until the module itself calls the number of the user seeking to be connected, after identification of this password and automatic entry of the call number of the authorized set.

If the set or terminal of the caller is in limited-access or closed premises, to which the person attempting fraud does not

normally have access, it cannot be connected to the server, even if he uses the fraudulently acquired password.

Therefore, in order to thwart the system, the person perpetrating fraud not only must have the password, but also call from the set of the authorized user, which confers a quasi-absolute security to this system.

Other characteristics of a device in accordance with the invention will appear via the following description of an embodiment, given as indicative and non-limiting, in reference to the annexed drawing, on which the sole figure is a synoptic diagram of the device considered.

On the figure, reference number 1 designates a user terminal, of a type known per se and in particular having a number keyboard, of the type of an ordinary telephone set, associated with a monitor screen, or a combined unit of the type of a "Minitel" screen, with decimal numbering, or preferably one called "DTMF" (Dual Tone Modulation Frequency); this numbering may be complete, or if necessary, abbreviated. In all cases, this terminal is adapted to permit a connection of the user to the telephone network 2 in order to call, by the intermediary of a connection device 3 in accordance with the invention, a server 4 capable of providing the user with particular data, of a confidential nature, only when this user is authorized to know the data by means of the use of an appropriate identification code.

The device 3 makes it possible to avoid the connection between the user 1 and the server 4 being made when this code has been divulged accidentally, or even when it has been stolen or directly or indirectly made known to persons unauthorized to make this usage.

The numbering of the server 4 by the terminal 1, triggers in the connection device 3 a call detector circuit 5 of a type known per se that, after processing of the ringing signal conveyed by the corresponding line of the network 2 coming to the connection device 3, closes a first contact of a relay 6, connecting the terminal of the user 1 with a commutation module 7, which in return informs the user that his line is taken, as in an ordinary telephone communication.

Then the user is invited, by any appropriate means, for example by an audio or even vocal signal, to enter on the keyboard of his terminal the code that is going to make it possible to identify it, in particular this consisting of a series of numbers, in particular signals of specific frequencies. Then the corresponding code is analyzed in a detection circuit 8, and then, after comparison with a preregistered reference code, adapted to deliver at the output of this circuit an authorization signal, also admitted to the communication module 7 by a second relay contact 6.

Advantageously, the call detector 5 has a timing circuit (not shown) capable of automatically opening the relay 6 and interrupting the communication with the terminal 1 when the user enters an appropriate code on the line and, in particular, when the detection circuit 8 does not send an output signal to the communication module,

in particular when the code introduced does not correspond to any of the authorized codes for all of the users of the server 4.

On the other hand, in the case where the detection circuit 8 delivers an output circuit to the commutation module 7 for the identification of the code emitted by the user, this module is put under voltage so as, in turn, to deliver a command signal to a callback module 9 on the one hand, or to a supervision module 10 on the other.

In fact, in accordance with the invention, the activation of the recall module 9 by the commutation module 7 will make it possible, after the line 2 of connection with the user terminal 1 has been disconnected at the end of the predetermined time, by opening the connection relay 6, for the server itself to call back the user.

In these conditions, if the server 4 is called by any user, in a particular case having an access code possibly obtained in an unauthorized way, the server will assure a complementary security monitoring, by prohibiting a direct connection as in the classic solution where the statement of the access code is in itself sufficient, but by subordinating the connection between the user 1 and the server 4 to a callback operation by the latter to the telephone set belonging to the user and the call number of which is obviously distinct from the code itself assigned to this user.

The callback module 9 thus has a memory such that, after identification of the code of the user by the commutation module 7, it



provides the module with the call number of this user, which can be directly entered by a keyboard 11 controlled automatically from this memory.

The calling of the user's set 1 by the module 9 assures, by the intermediary of the relays 12 and 12', the closing of the line and the connection of the corresponding terminal to the server 4 by the intermediary of the outputs of a transformer 13, permitting them to be connected from that time and the user to interrogate the server as he wishes.

The supervision module 10 makes it possible to continuously monitor the proper operation of the detection device 3, by analyzing the frequency of the signal issued by the commutation module 7, by authorizing the closing of the relay 12' making the connection of the user and the server, and by causing the opening of the circuit and the disconnection of the line at the end of the transaction.

Thus a connection device that makes it possible to obtain a connection between a user and a reserved access server is obtained, thanks to the use of a double security, the former proceeding from the entry of a confidential code by the user himself, the latter by the fact that, once this code is analyzed and identified, the server himself calls back the user in order to be connected to his line, by using his call number, which assures the correlation with the code provided preliminarily.

In these conditions, in case of unauthorized use of the access, the server cannot be directly connected to the caller's line. It will

be only after callback of the particular number of the authorized user, consequently requiring that the latter is served by his own set, which the unauthorized called could not do a priori.

Of course, it follows that the invention is not limited to the example described in detail above; on the contrary, it includes all versions. In particular, the device by no means prevents the user from voluntarily switching his own line to another set corresponding to another call number by using the classic call transfer system. However, this possibility does not call into question the double security obtained which remains valid in all cases.

#### **CLAIMS**

1. A device for connecting an interrogation terminal (1) with a confidential data server (4), having a server call detection circuit (5) made by the intermediary of the telephone line (2) of a user, occupying this line for a predetermined time, a circuit (8) for identifying a code formed by the caller, put into operation by the detection circuit before reaching the predetermined time, which then interrupts the communication coming from the caller, wherein it also has a commutation module (7) controlled by the detection and identification circuits, which releases a callback module (9) taking the line for automatically calling the caller's set and, simultaneously, connecting to the latter the data server, thus the connection to the user's terminal.

2. The device in accordance with Claim 1, wherein it has a monitoring and supervision module (10), capable of interrupting the

line (2) at the end of use, by reinitializing the system.

